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May, 1998

ENVIRONMENTAL ASSESSMENT
BLM/EK/PL-98/009

NEWCREST RESOURCES INC.
TUSCARORA EXPLORATION PROJECT

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FINDING OF NO SIGNIFICANT IMPACT
AND
DECISION RECORD
NEWCREST RESOURCES INC. TUSCARORA EXPLORATION PROJECT
ELKO COUNTY, NEVADA

BLM/EK/PL-98/009
3809, N16-97-001P

Finding of No Significant Impact

The proposed action to allow Newcrest Resources, Inc. to conduct exploration and development drilling within the project boundary near the town of Tuscarora from late spring to fall of 1998 has been environmentally evaluated in the Newcrest Resources, Inc. Project Environmental Assessment BLM/EK/PL-98/009. The 43 CFR 3809 Regulations require the claimant to file a Plan of Operations when the claimant proposes to create more than five acres of surface disturbance on their claims at any given time before conducting reclamation activities.

Based on the analysis of potential environmental impacts contained in the attached Environmental Assessment, it is my decision that this document adequately shows that no significant effects on the human environment will occur. Therefore an environmental impact statement is not required and will not be prepared.

Decision

It is my decision to authorize the Newcrest Resources, Inc. Tuscarora Exploration Project as described in the proposed action of BLM/EK/PL-98/009. This decision will permit the exploration project from late spring to early fall of 1998.

Monitoring

Monitoring will consist of a Bureau specialist conducting compliance inspections of the Newcrest Resources, Inc. Tuscarora Exploration Project. All compliance inspections will be documented into the project file at the BLM Elko office.

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Stipulations

1. Water bars will be constructed at intervals along exploration and ancillary roads, where necessary, to channel drainage off the roads and reduce erosion. Impacts from erosion to soils will be mitigated by keeping surface disturbance to the required minimum to construct and operate the project.

2. During the operational phase of the project, Newcrest Resources, Inc. will monitor all unreclaimed surface disturbances within the project area for the development of noxious weeds (as defined by state and federal regulations). Reasonable measures to eliminate or prevent the spread of these plants will be considered by Newcrest Resources, Inc. in consultation with BLM.

3. Any and all disturbance, including road and drill pad construction, reclamation, etc., shall be kept at least 100 feet from the significant or potentially significant historic localities within the Tuscarora mining district.

4. Historic localities, including artifacts and equipment within them shall not be damaged, disturbed, or removed. Should the conditions of any significant historic localities within the Tuscarora mining district prove to be altered during the period of operations, the localities shall be mitigated through data recovery. The cost of mitigation shall be borne by Newcrest Resources, Inc.

5. A contracting archaeologist permitted by BLM-Nevada must inspect the flagged access routes to the drill sites prior to ground disturbing activities. Following this inspection, the archaeological contractor will notify the BLM in writing (by FAX, if necessary) that the routes follow the agreed upon locations and that there will be no adverse effect to any archaeological site or locality.

6. Drilling operations, road building, or other surface disturbing activities shall be located at least 100 yards from any riparian areas or springs.

7. Approval of this project is subject to satisfactory posting of a bond instrument.

Rationale

As a result of the analysis in the Newcrest Resources, Inc. Tuscarora Exploration Project Environmental Assessment, BLM/EK/PL-98/009, it was determined that the proposed action would not result in undue or unnecessary degradation to the public lands. The proposed action is in conformance with the Elko Resource Area Management Plan, Issue - Minerals, Management Prescription - 1.

Implementation of the proposed action will allow Newcrest Resources, Inc. to conduct exploration drilling within the project area from late spring to fall of1998. The 43 CFR 3809 regulations require the claimant to file a Plan of Operations when the claimant proposes to create

more than five acres of surface disturbance on their claims at any given time before conducting reclamation activities.

The No-Action Alternative was not selected because it would not allow Newcrest Resources, Inc. to create more than five acres of surface disturbance, prior to conducting reclamation activities at a given time while conducting their drilling program for this project. The General Mining Law of 1872 gives the claimant the right to explore, discover, and diligently develop a mineral deposit on their claims. The Bureau of Land Management's responsibility is to determine and assure that unnecessary or undue degradation does not occur to the public lands during the exploration for locatable mineral deposits.

Helen Hankins

HELEN HANKINS, Manager
Elko Field Office

May 29, 1998

DATE

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1.0 INTRODUCTION/PURPOSE AND NEED

Newcrest Resources, Inc. (Newcrest) proposes to conduct mineral exploration activities on public lands administered by the United States Bureau of Land Management (BLM), Elko Field Office. The proposed action, the Tuscarora Exploration Project, is described in the proposed *Tuscarora Exploration Plan of Operations Amendment and Reclamation Plan Permit Application* dated December 1996. The proposed exploration activities would occur within the 2,399-acre Tuscarora Operations Project Area, located approximately one-half mile east of Tuscarora, Nevada (Figure 1-1). The proposed Tuscarora Exploration Project would be located within portions of:

- Sections 1, 2, 3, 10, and 11, Township 39 North, Range 51 East
- Sections 35 and 36, Township 40 North, Range 51 East

The majority of the drilling would occur in concentrated drilling locations specified by Newcrest. The proposed project time frame is summer 1998. Figure 1-2 presents the project location for the project area.

1.1 INTRODUCTION

The Tuscarora Exploration Project area is within the Tuscarora Mining District, along the southeastern slope of Mount Blitzen in the Tuscarora Range. The District has been historically mined for silver and gold. The first recorded discovery of placer gold in the District was made in 1867. Placer gold was mined on a limited scale by the Beards for a number of years (Lincoln, 1923 and Townley, 1971). Silver was discovered in the District in 1871; active mining continued through 1876 during which time six silver mills were in operation. The Dexter gold mine was discovered in 1898 and continued gold production through 1903 (Townley, 1971). The Dexter mine briefly re-opened in 1912 (Lincoln, 1923). The Tuscarora Nevada Mines Company opened a mining camp from 1907 to 1915 (Lincoln, 1923). Several exploration operations have been conducted in the Tuscarora area from the 1900's to present. According to the Nevada Bureau of Mines and Geology, the most recent mining activity in the Tuscarora district includes a small open pit mine and heap leach which was operated by Horizon Gold Corporation. They mined approximately two million tons ore and waste, and treated about one million tons of ore. The operation, which was located predominantly on fee lands, has been idle since 1992 and is currently undergoing reclamation.

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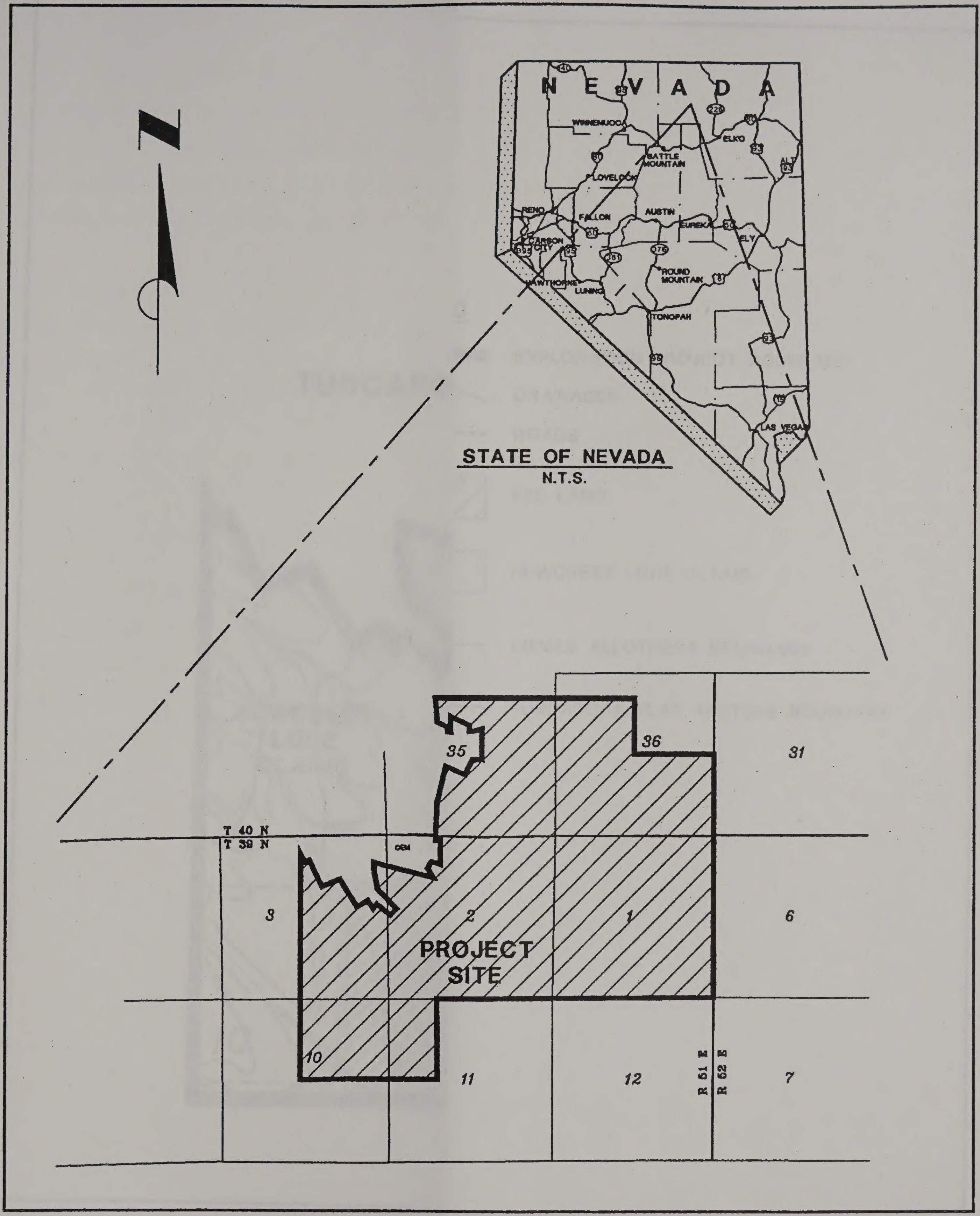

FIGURE 1-1

REGIONAL LOCATION MAP

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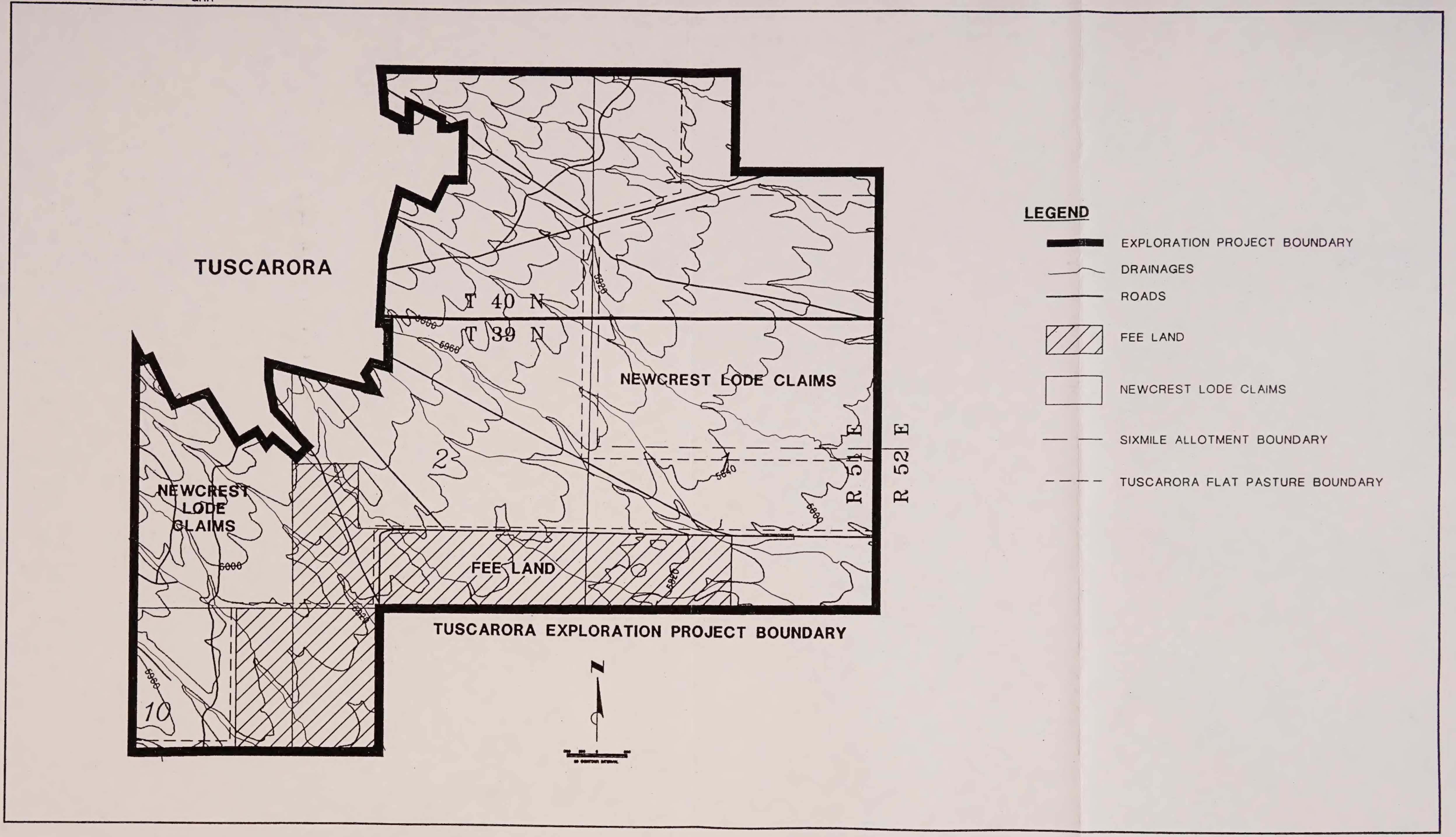

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FIGURE 1-2

LOCATION MAP

1.2 PURPOSE AND NEED

The purpose for the proposed Tuscarora Exploration Project is to define the nature and extent, shape, and economic value of precious metal-bearing deposits within the Tuscarora Exploration Project area. The proposed drilling operations are needed to evaluate the potential for future mine development. The need for the proposed project arises from the international, national, and regional market demands for gold.

1.3 ISSUES

The following issues and concerns were raised by agencies during the scoping process:

- Wildlife - potential impacts to sage grouse strutting grounds; removal of vegetation during the avian breeding season may result in destruction of bird nests and/or their contents
- Threatened, Endangered and Special Status Species - threatened, endangered and special status species may occur in the project area
- Wetlands - potential impacts to wetlands if identified within the project area

1.4 LAND USE PLAN CONFORMANCE STATEMENT

The proposed action and alternative described below are in conformance with the Elko Resource Management Plan, Issue: Minerals Management, Prescription 1, and are consistent with Federal, State, and local laws, regulations, and plans to the maximum extent possible.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

Newcrest submitted the *Tuscarora Exploration Plan of Operations and Reclamation Permit Application* to the BLM Elko Field office in December 1996. This Plan of Operations proposes exploration activities involving approximately 12 acres of disturbance within the Tuscarora Operations Project Area in summer 1998. The proposed exploration project would occur on public lands administered by the BLM. The applicant address is:

Newcrest Resources, Inc.
1536 Cole Blvd., Suite 140
Golden, Colorado 80401

The proposed Tuscarora Exploration Project would be located within portions of:

- Sections 1, 2, 3, 10, and 11, Township 39 North, Range 51 East
- Sections 35 and 36, Township 40 North, Range 51 East

2.2 PROPOSED ACTION

Newcrest proposes to conduct exploration activities that include the development of:

- 64 drill holes
- Associated drill pads and sumps
- Exploration access routes
- Cross country travel routes

The project area in which activities would occur encompasses a total of 2,399 acres of public lands administered by the BLM. The proposed disturbance within the project area would total approximately 12 acres. The Tuscarora Exploration Project area is depicted on Figure 2-1. Table 2-1 provides a breakdown of the proposed disturbance by activity.

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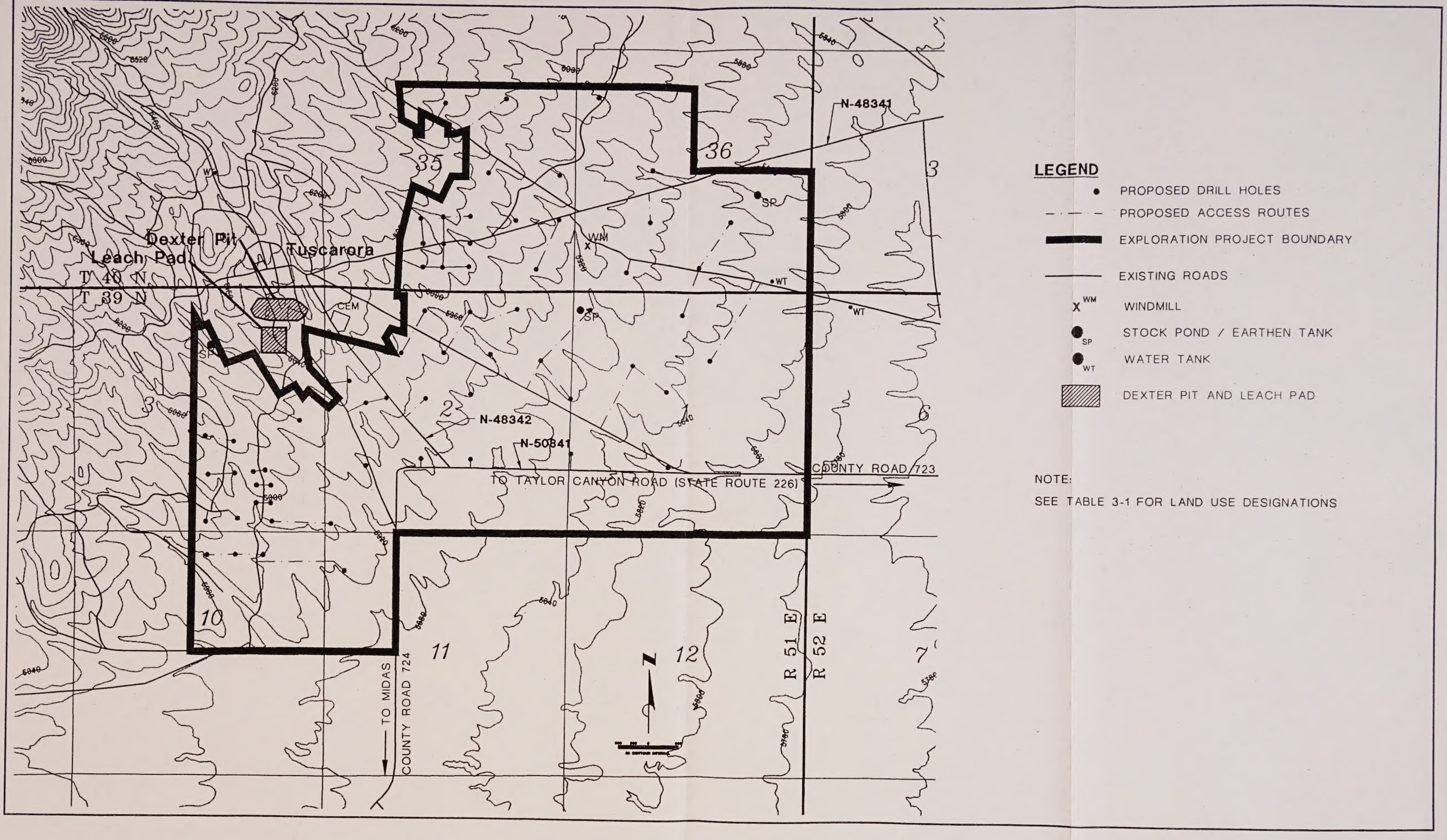

TUSCARORA EXPLORATION PROJECT
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FIGURE 2-1
EXPLORATION PROJECT AREA

TABLE 2-1
PROPOSED DISTURBANCE

Disturbance Type	Acres (public land)
Reverse circulation drill pads	0.5
Core drill pads	0.3
Sumps	2.1
Access Routes	0.9
Cross-country travel routes	7.7
Total	**11.5**[1]

[1] This total will be rounded up to 12 acres for bonding purposes and will appear as 12 acres for the remainder of the text.

2.2.1 Drilling Methods

Newcrest proposes to use reverse circulation air rotary drill rigs and core drill rigs. Each type of drill rig has its advantages and disadvantages, depending upon the nature of the material being drilled, the depth of the target, and the information sought.

Reverse Circulation

The reverse circulation air rotary drill rig is standard exploration drill equipment, capable of a drilling range of 100 to 2,000 feet. At shallow depths, dry air is the working fluid, with water injected optionally for dust suppression. As water is encountered, a biodegradable detergent is typically added to improve sample recovery in the return stream.

The reverse circulation rig selected for this exploration project is an all-terrain track-mounted drill rig. This rig can be operated with optional auxiliary booster compressors to enable deeper penetration. This rig uses a down-hole, pneumatic hammer and percussion bit or rotary tricone bit to penetrate rock strata; the latter is most often reserved for drilling under heavy water conditions.

The all-terrain rig can be leveled on existing terrain and a minimal 20-foot by 20-foot area around the drill hole will be cleared of topsoil and vegetation, if necessary, to allow drainage of drilling fluids to the sump. The remainder of the drill site would not be cleared and graded, leaving the natural vegetation. Sumps for containment of all discharged fluids would be constructed, if necessary, to dimensions of approximately 50 feet by 30 feet total disturbance.

Additional equipment that would be used in conjunction with reverse circulation drilling includes an all-terrain water/rod truck, a one-ton 4x4 service truck, and a half-ton 4x4 pickup truck.

Core Drilling

Core rigs are used where solid samples of rock core are needed for geological, geotechnical or metallurgical studies. Core drilling is significantly more expensive than rotary drilling. Because of this, holes may be drilled with reverse circulation or mud drills to a target depth, then core drilled through the area of interest. Core holes would normally be 500 to 1,500 feet in depth.

In general, more fluid is discharged from core drills and can be retained in tanks, which are then occasionally drained to a sump approximately 50 feet by 30 feet total disturbance. Lubrication for core drilling is provided by a thin slurry of bentonite, water, and various viscosity modifiers and dispersants. For this project, a 20-foot by 100-foot area around the drill hole would be cleared of topsoil and vegetation and graded to allow drainage of drilling fluids to the sump.

Newcrest plans to use a truck-mounted core rig (Longyear 44 or equivalent) exclusively. Additional equipment that would be used in conjunction with core drilling includes a 4x4 water truck, a one-ton 4x4 service truck, and a half-ton 4x4 pickup truck.

2.2.2 Exploration Access Routes

When drill sites can not be accessed via overland travel and cross country travel routes via track-mounted drill rig, exploration access routes would be constructed. Approximately 2,000 linear feet of temporary exploration access routes are anticipated to be constructed to facilitate access to the drill sites by core drill rigs.

Most temporary access routes would be constructed with a bulldozer using "cut only" methods. "Cut only" would be necessary for most temporary access routes because level surfaces are essential for movement of the relatively top-heavy, truck-mounted drilling equipment.

Whenever possible, and primarily on reasonably level terrain, topsoil would be salvaged and stockpiled to the uphill margin of the temporary road cut. On steeper slopes, topsoil would be stored as side cast along the periphery of the temporary access routes, pads, and sumps. Although this method would mix the limited existing quantities of topsoil with the subsoils, experience has shown that the resulting surface soils can support vegetation. Newcrest may elect to push topsoil uphill prior to cutting temporary access routes on

steep slopes; however, this would result in increased surface disturbance due to bulldozers working "back-and-forth" below the proposed temporary access routes.

Temporary access routes would be built to an average travel width of 10 to 12 feet (depending upon the terrain) for a total average disturbance width of 20 to 25 feet. Temporary access routes cut on a side slope would typically be sloped in at a grade of one to two percent. Temporary access routes would be constructed at a grade of eight percent or less. Road maintenance and upgrading would be performed to facilitate access and minimize adverse effects of erosion from heavy traffic and water runoff.

Exploration access routes upgrading and maintenance procedures may include:

- Periodic dressing or blading of frequently used road surfaces with a motor patrol
- Installation of drainage controls such as water bars and ditches to control road damage, soil loss, and sediment impacts from erosion
- Road maintenance, such as drainage of mudholes, to provide access during wet seasons
- Surfacing some road segments with gravel to control muddy conditions so that continued access along the defined route of travel can be assured
- Installation of culverts, if required, at low points in drainages. It is not anticipated, however, culverts will be required for this project
- Powerlines will be avoided.

2.2.3 Equipment

Equipment needed for construction and drilling activities would be used strictly on an as-needed basis. A bulldozer would be used for road and site construction. All-terrain reverse circulation drill rigs would be supported by an all-terrain water/rod truck, a one-ton 4x4 service truck, and a half-ton 4x4 pick-up truck, as needed. Core drill rigs would be supported by a 4x4 water truck, a one-ton 4x4 service truck, and a half-ton 4x4 pick-up truck, as needed. Newcrest could have a maximum of two drill rigs working in the project area. Newcrest anticipates an average number of one drill rig would be in the project area, depending on drill rig availability and need.

2.2.4 Operating Schedule

Exploration drilling activities would operate 24 hours per day during the summer of 1998, as conditions warrant.

2.2.5 Work Force

Newcrest proposes to utilize a maximum of two drill rigs with two contract employees per rig for a maximum work force of four contract employees. One geologist, currently employed by Newcrest, would also be associated with this exploration project. Contract labor support staff would be employed on an as- needed basis.

2.2.6 Air Quality

An *Air Quality Permit to Construct for Surface Disturbance* would be acquired if necessary from the Nevada Division of Environmental Protection (NDEP), Bureau of Air Quality. Newcrest proposes to water constructed access and exploration roads, as necessary, to control dust.

2.2.7 Solid and Hazardous Materials

Solid Wastes

All project-related refuse would be disposed at an approved landfill. Newcrest would conduct oversight of the drilling contractors to assure that no refuse would be disposed on site.

Hazardous Materials

Newcrest would comply with applicable Federal and State laws dealing with the use, storage, and disposal of chemicals, petroleum and petroleum products. Hazardous wastes would not be generated in the project area. In the event that regulated materials, such as diesel fuel, are spilled, measures would be taken to control the extent of the spill and clean the affected area, the appropriate agency would be notified in accordance with the applicable Federal and State regulations.

2.2.8 Water Resources

Drill holes would be plugged according to Nevada Division of Water Resources and Nevada Administrative Code (NAC) 534.425 through 534.428. Springs or surface waters would be avoided during and after completion of all activities. Proposed environmental protection measures would keep indirect impacts to surface waters to a minimum by using practices detailed in Chapter 2 of the State of Nevada Best Management Practices (BMP) Manual (NDEP, 1994). Sediment control structures would be constructed when necessary to control sediment runoff and sedimentation. Sediment control structures would include, but would not be limited to, silt traps and fences, sediment ponds, and/or settling basins. Straw, hay bales, or synthetic geotextile fabrics would be used to construct silt traps and fences. Newcrest would maintain these structures during the exploration activities. Upon completion of exploration activities and successful reclamation, sediment control structures would be removed or reclaimed.

2.2.9 Wetlands, Riparian Zones

Exploration activities would avoid wetlands and riparian zones by at least 100 yards.

2.2.10 Wildlife

Exploration activities would be suspended within a half-mile buffer zone along the eastern border of the project area from March 15 until April 30 to avoid sage grouse strutting and nesting activities. Drilling in the northern quadrant would be avoided during December and January to minimize disturbance to sage grouse wintering activities.

2.2.11 Cultural Resources

The Class III cultural resources survey identified 225 cultural resources in the project area. Exploration activities would avoid known eligible or potentially eligible cultural resource sites. A buffer zone of at least 150 feet would be maintained around the 19 contributing elements to site CrNV-12-9311. Should cultural resources be uncovered during exploration activities, all operations in the immediate vicinity would stop and the BLM Elko Field Office would be contacted for further direction.

2.2.12 Noxious Weeds

Hoary cress (whitetop) is reported to appear in abundance within the proposed Tuscarora project area and the nearby vicinity. Newcrest would attempt to reduce the spread of hoary cress on lands disturbed by the proposed project by:

- Avoiding travel whenever possible through areas infested by hoary cress to prevent windblown and mechanical transport of seed sources caused by exploration activities.
- Inspecting, and if necessary, cleaning vehicles traveling out of the project area for the obvious presence of hoary cress seed sources, such as plant fragments, that may be mechanically transported by exploration activities.

If hoary cress appears to be reestablishing or infesting in reclaimed areas within one year of reclamation activities, Newcrest would consult with BLM to conduct other appropriate treatment methods, such as manual, mechanical, or herbicide controls as described in *Programmatic Environmental Assessment of Integrated Weed Management on Bureau of Land Management Lands* (BLM, 1998). Control of hoary cress would not be conducted within 1/4 mile of active sage grouse leks or during sage grouse strutting season.

2.2.13 Reclamation

The *Tuscarora Exploration Plan of Operations Amendment and Reclamation Permit Application* describes the detailed reclamation for this project. Reclamation for both public and private lands would be consistent with the requirements of Nevada Revised Statute (NRS) and NAC 519A regulations, 43 Code of Federal Regulations (CFR) 3809, and in accordance with the "Nevada Interim Standards for Successful Revegetation" (BLM Instruction Memorandum No. NV-94-026).

Newcrest's long-term reclamation goal for the Tuscarora Exploration Project would be to create a safe, stable, and productive post-exploration land use for livestock grazing and wildlife use.

Proposed reclamation associated with the Tuscarora Exploration Project would consist of hole plugging in accordance with NAC 534.425 through 534.428, recontouring, selective replacement of topsoil, and seeding.

All temporary roads, drill pads and sumps constructed by a dozer typically have side cast material as a result. The volume of side cast material can vary significantly, depending primarily upon topography. Roads which generate side cast material would be recontoured to an approximate pre-disturbance slope by pulling berms and side cast material back onto the road surface area. The material would be replaced with either backhoes or dozers, depending upon site-specific consideration of slope, proximity of heavy equipment, and potential of creating unnecessary additional disturbances while recontouring. Recontoured surfaces would be re-established as near as possible to the pre-disturbance topography.

Temporary roads, pads, and sumps which do not require replacement of side cast material would be scarified or ripped to a depth of approximately eight inches prior to revegetation efforts. For cross-country travel routes, efforts would be made to scarify only those portions of routes which require seeding (e.g., tire tracks) while minimizing disturbance to established vegetation.

Recontouring and scarifying temporary roads, drill pads and sumps would be the primary means by which seedbeds would be prepared. A roughened surface would remain to provide a better microenvironment for seed and moisture to be trapped and held. Additional benefits include slower runoff, increased infiltration, and in general, more favorable conditions for seed germination.

The proposed reclamation plant list is presented in Table 2-2. Modification to the plant list and application rates would be developed through consultation with and approval by the BLM and NDEP. Temporary roads and drill sites would be reclaimed as soon as practical after the cessation of drilling activities in the area.

Application rates for the mixture would be 7.5 to 9 pounds of pure live seed per acre. Species would be selected from the reclamation plant list based upon their price and availability. Seeding procedures would be dependent upon site characteristics. Recontoured roads, pads and sumps with severe slopes would be seeded with hand-held broadcast seeders or an electric broadcast seeder mounted on an All-Terrain Vehicle. A chain-drag may be used to cover the seed. If drainage structures have been installed, Newcrest would remove the structures during reclamation and reshape any fill material in drainages to reestablish preexisting seasonal flow channels. Suitable material would be used to armor reshaped drainages, if necessary, to minimize erosion.

TABLE 2-2
RECLAMATION PLANT LIST

COMMON NAME	SCIENTIFIC NAME
GRASSES	
Bluebunch wheatgrass	*Agropyron spicatum*
Indian ricegrass	*Oryzopsis hymenoides*
Webber ricegrass	*Oryzopsis webberi*
Great Basin wildrye	*Elymus cinereus*
Green needlegrass	*Stipa viridula*
Idaho fescue	*Festuca idahoensis*
Sandberg bluegrass	*Poa sandbergii*
Slender wheatgrass	*Agropyron trachycaulum*
FORBS	
Arrowleaf balsamroot	*Balsamorhiza sagittata*
Small burnet	*Sanguisorba minor*
Eriogonum (buckwheat)	*Eriogonum*
Rockcress	*Arabis*
Chickpea milkvetch	*Astragalus cicer*
Northern sweetvetch	*Hedysarum boreale*
Palmer Penstemon	*Penstemon palmeri*
Western yarrow	*Achillea millefolium lanulosa*
Blue flax	*Linum lewisii*
Prostrate summer kochia	*Kochia prostrata*
Gooseberryleaf globemallow	*Sphaeralcea coccinea*

Source: Newcrest, 1996.

2.3 ALTERNATIVE TO THE PROPOSED ACTION

2.3.1 No Action Alternative

The Mining Law of 1872 grants the claim holder access and the right to explore their claims in a prudent and diligent manner. Under the No Action Alternative, Newcrest's proposed Tuscarora Exploration Project would not be approved. Newcrest would not be able to further define and discover ore deposits on public lands; however, Newcrest would continue exploration activities on private lands. Road, drill pad, sump construction, and cross-country travel would not occur on public lands.

3.0 AFFECTED ENVIRONMENT

The Tuscarora Exploration Project area is characterized by rolling high desert mountain foothills. The proposed project site is within the Tuscarora Mountains; elevations in the immediate area range from approximately 5,780 to 6,160 feet above mean sea level (AMSL).

3.1 PROPOSED ACTION

The following critical elements of the human environment are not present or are not affected by the proposed action or alternative in this Environmental Assessment:

- Air Quality
- Areas of Critical Environmental Concern
- Farmlands (Prime or Unique)
- Floodplains
- Paleontology: Impressions of wood fragments are present in some of the reworked volcaniclastic units, but no other known paleontological feature is present in the district.
- Wastes (Solid or Hazardous)
- Wild and Scenic Rivers
- Wilderness
- Native American Religious Concerns: Letters of notification were sent to the Western Shoshone Historic Preservation Society (WSHPS), Felix Ike, Chairman of Te-Moke Tribal Council, Gelford Jim, Chairman of the Battle Mountain Band of the Te-Moke Tribe of Western Shoshone, Raymond Gonzales, Chairman of the Elko Band of the Te-Moke Tribe of Western Shoshone, Vince Garcia, Chairman of the South Fork Band of the Te-Moke Tribe of Western Shoshone, and Andrea Woods, Chairman of the Wells Band of the Te-Moke Tribe of the Western Shoshone, in January 1997 initiating consultation. After numerous inquiries with Larry Kibby, Director of WSHPS, Felix Ike, Gelford Jim, Raymond Gonzales, Vince Garcia, and Andrea Woods, no concerns were identified.
- Environmental Justice

Bureau specialists have further determined that the following resources, although present in the project area, are not affected by the proposed action:

- Recreation
- Socioeconomics
- Geology: The Tuscarora District lies at the foot of Mount Blitzen on the west edge of Independence Valley in Sections 34-36, T40N, R51E and Sections 1-12, T39N, R51E. Placer gold was discovered in McCann Creek in 1867 followed by the discovery of silver-bearing veins near the present Tuscarora townsite in 1871. Most silver has been produced from veins including the Grand Prize, Commonwealth and Navajo, all of which are located within a mile of the Tuscarora townsite. Gold has been produced from placer deposits lying one to two miles southwest of town and from the Dexter lode adjacent to the south edge of

town. About 200,000 ounces of gold and 7.3 million ounces of silver have been produced from the district since 1867.

The Tuscarora District is underlain by volcanic rocks of Eocene age. The basement beneath the volcanic rocks is presumably made up of Paleozoic sedimentary rocks. The oldest rocks in the district are andesite flows and shallow intrusions exposed within a mile of the townsite. Overlying the andesites are a series of lithic tuffs, crystal lithic tuffs, pyroclastic breccias, and tuffaceous siltstone of probable dacitic composition make up most of the district. These rocks are cut by two principle sets of faults, one trending north-northwest and dipping west and the other trending east-northeast and dipping north. Most of the volcaniclastic rocks exhibit argillic and/or silica-adularia alteration of variable intensity.

The Exploration Project area lies in the southern and southeastern parts of the district is covered by Quaternary alluvium. This alluvium is composed of clay-rich gravel deposits and minor interbedded clay horizons and is a few feet to as much as 450 feet thick (Newcrest, 1996b).

- Lands: Access to the project area is available by traveling north on State Highway 225 from Elko to State Highway 226, north on State Route 226 to Tuscarora Road (County Road 723), then west on the Tuscarora Road to the Tuscarora Project Area.

Figure 2-1 depicts the proposed Tuscarora Exploration Project which would occur within portions of:

- Sections 1, 2, 3, 10, and 11, Township 39 North, Range 51 East
- Sections 35 and 36, Township 40 North, Range 51 East

Newcrest controls the mining claims within the project area which are staked for locatable minerals. Land uses in the project area are listed in Table 3-1 and shown on Figure 3-1.

TABLE 3-1
LAND USES IN THE VICINITY OF THE TUSCARORA EXPLORATION PROJECT AREA

Serial No.	Type of Right-of-Way	Grantee
N-5421	Powerline	Sierra Pacific Power Company
N-33412	Telephone	Rural Telephone Company
N-46278	Telephone	Rural Telephone Company
N-48341	Access Road	Elko County
N-48342	Access Road	Elko County
N-50841	Access Road	Elko County

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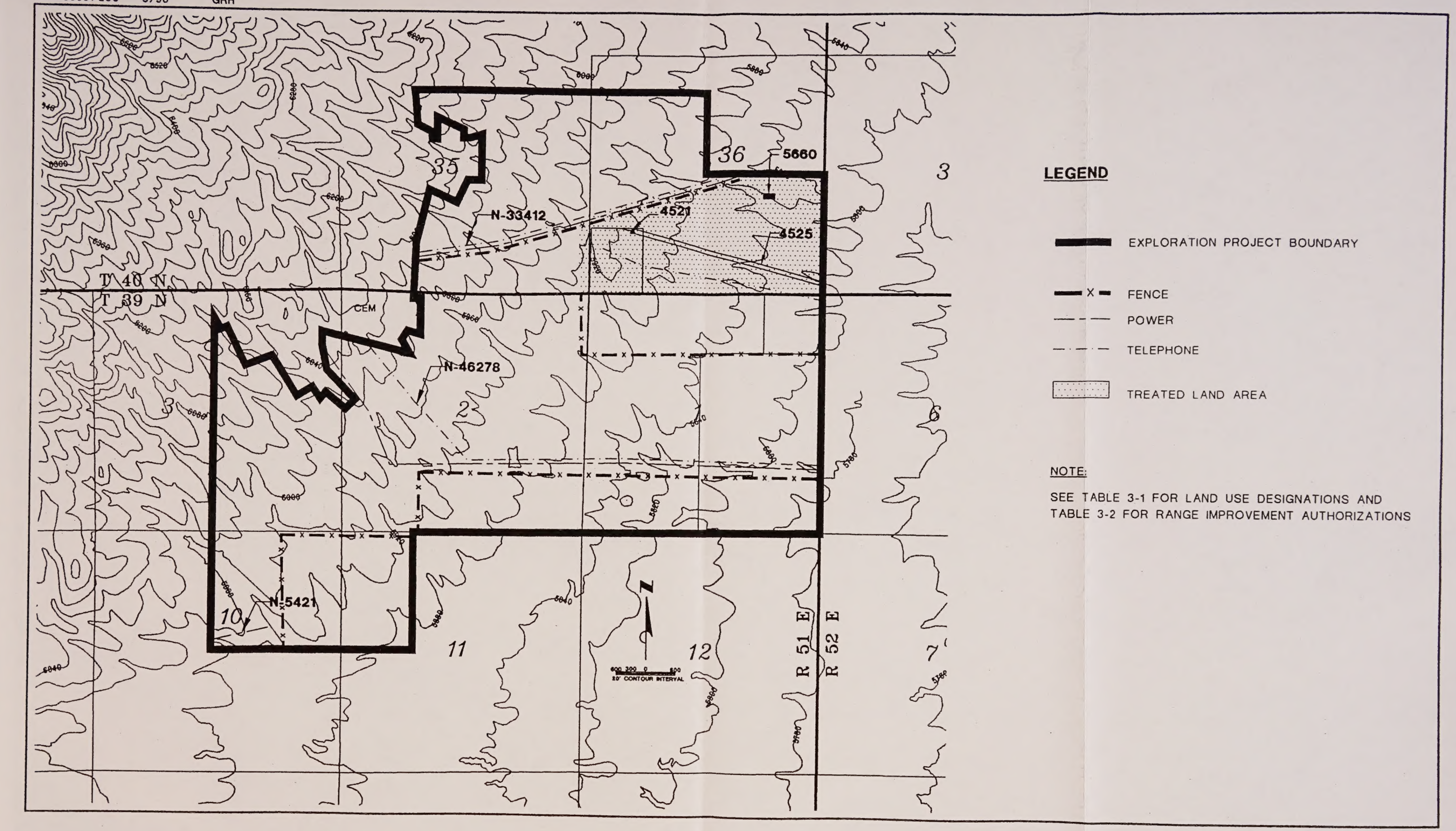

NOTE:

SEE TABLE 3-1 FOR LAND USE DESIGNATIONS AND TABLE 3-2 FOR RANGE IMPROVEMENT AUTHORIZATIONS

TUSCARORA EXPLORATION PROJECT
ENVIRONMENTAL ASSESSMENT

FIGURE 3-1

LAND IMPROVEMENTS AND ACCESSES

- Livestock Grazing: The proposed project is located within the Tuscarora Flat Pasture, Tuscarora Allotment, with private lands designated as base property for the Quarter Circle S (Van Norman Ranches, Inc.), and the Sixmile Allotment. Allotment boundaries are shown in Figure 3-1. The permittees for the Tuscarora Flat Pasture are Dean and Sharon Rhoads and Van Norman Ranches, Inc. The Sixmile Allotment permittee is Nelo Mori (Nyrehn, 1997).

  Approximately two animal unit months (AUM's) are associated with the proposed 12 acres of disturbance on public lands. The total number of AUM's of specified livestock grazing in the Tuscarora Flat Pasture is 502 for Dean and Sharon Rhoads and 512 AUM's for Van Norman Ranches, Inc. Since the loss of two AUM's would only be 0.4 percent of the total number of AUM's of specified livestock grazing for the pasture and only 0.02 or 0.04 percent, respectively by permittee, of the total number of AUM's of specified livestock grazing for the allotment, no reduction or suspension in the total number of AUM's of specified livestock grazing would be required due to this proposed action (Nyrehn, 1997).

  The total number of AUM's of specified livestock grazing for the Sixmile Allotment are 184. If the total 12 acres of public land disturbance occurred within the Sixmile Allotment, an approximate impact and short term loss of two AUM's would result in a loss of only 1.1 percent of the total number of AUM's available. Assuming that some of the proposed activities would occur in other allotments, impact to the permittee's AUM's would be less than one percent and no reduction or suspension in the total number of AUM's would be made due to this proposed activity (Nyrehn, 1997).

  Range improvements are presented in Table 3-2 and shown on Figure 3-1.

TABLE 3-2
RANGE IMPROVEMENT AUTHORIZATIONS

Serial Number	Type of Range Improvement
4351	Treated Land Area (Seeding)
4521	Windmill
4525	Pipeline/Conduit
5660	Stock pond/Earthen Tank

  Newcrest does not plan to cut fences or install gates to gain access to drill holes; however, should fences need to be cut, they will be repaired immediately. Any openings would be suitably blocked to prevent cattle egress.

3.1.1 Water Resources

Surface Water

The Tuscarora Exploration Project area includes several ephemeral drainages that flow during seasonal storm events. These drainages are tributaries to McCann Creek and the South Fork of the Owyhee River. The South Fork of the Owyhee River is an interstate water that has Nevada water quality standards, as stated in

NAC 445A.225, that must be met. The project area also contains two known, but unnamed springs. The location of drainages and springs are shown on Figure 3-2.

Groundwater

Previously installed exploration drill holes in the area have encountered perched water tables at variable depths ranging from 50 to 200 feet. Airlift tests produced flow rates of 10 to 50 gpm in these aquifers. The bedrock groundwater table lies at a depth of about 200 feet at a distance of 2,000 feet south of the Dexter Pit (Figure 2-1) but deepens to 400 feet a mile south of the pit (Newcrest, 1996b).

3.1.2 Soils

Soils within the project area were mapped at the Order III Level by the Natural Resource Conservation Service (NRCS), formerly known as the U.S. Soil Conservation Service, and are described in the *Soil Survey of Northwest Elko County Area, Nevada, Parts of Elko and Eureka Counties (USDA, 1997).* Five distinct soil associations have been determined to occur within the Tuscarora Exploration Project area boundary as shown in Figure 3-3.

Each soil association consists of one or more soil series which have specific characteristics that allow them to be distinguished from other soil series within the association. Appendix A summarizes the USDA-NRCS Order III Soil Survey data, including the soil series, surface texture, taxonomic classification, landscape position, elevation of the individual soils that occur in each association, permeability, available water capacity, wind and water erosion hazard, percent slope, and approximate solum depth range. The solum in soil consists of the A and B horizons which are generally considered plant growth medium. The living roots and other biological activities are largely confined to the solum (USDA-NRCS, 1997).

The Welch silty loam has a slightly erodible rating for wind erosion, all other soils within the project area are very slightly erodible or not subject to wind erosion. The majority of soils in this area have a poor topsoil rating with limitations of too clayey, small stones or depth to rock. Soils within the Welch, drained-Welch Association have a fair topsoil rating, with suitability limitations of small stones or too clayey. Water erosion potential is low for Cotant, Graley, Crooked Creek and Welch soils, with the Stampede loam having a moderate hazard for water erosion.

The Crooked Creek silty clay loam soil is on the hydric soils list and is associated with a small riparian area along an ephemeral drainage at the southern edge of the project area.

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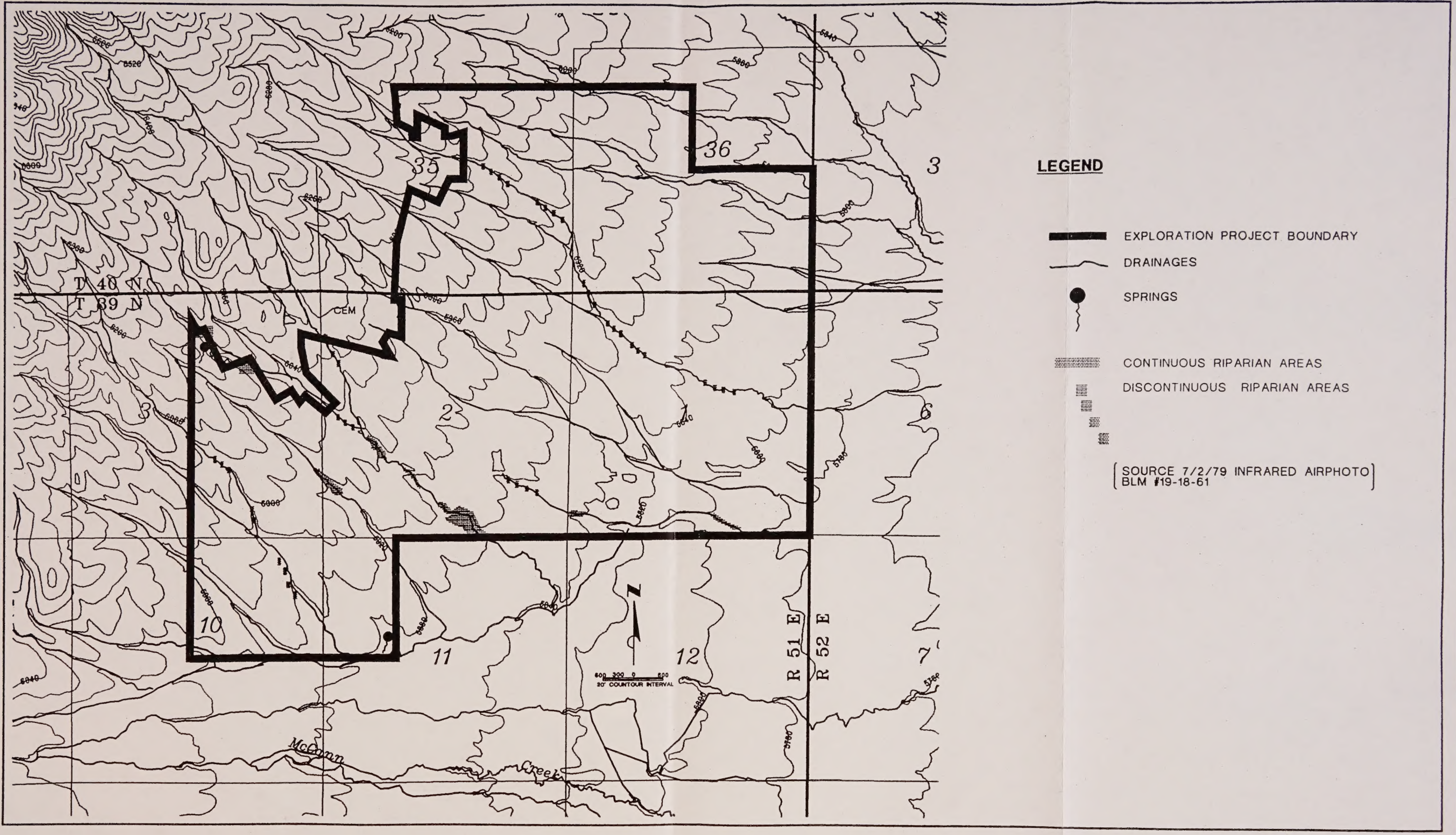

SOURCE 7/2/79 INFRARED AIRPHOTO BLM #19-18-61

FIGURE 3-2

SURFACE WATER AND RIPARIAN ZONES

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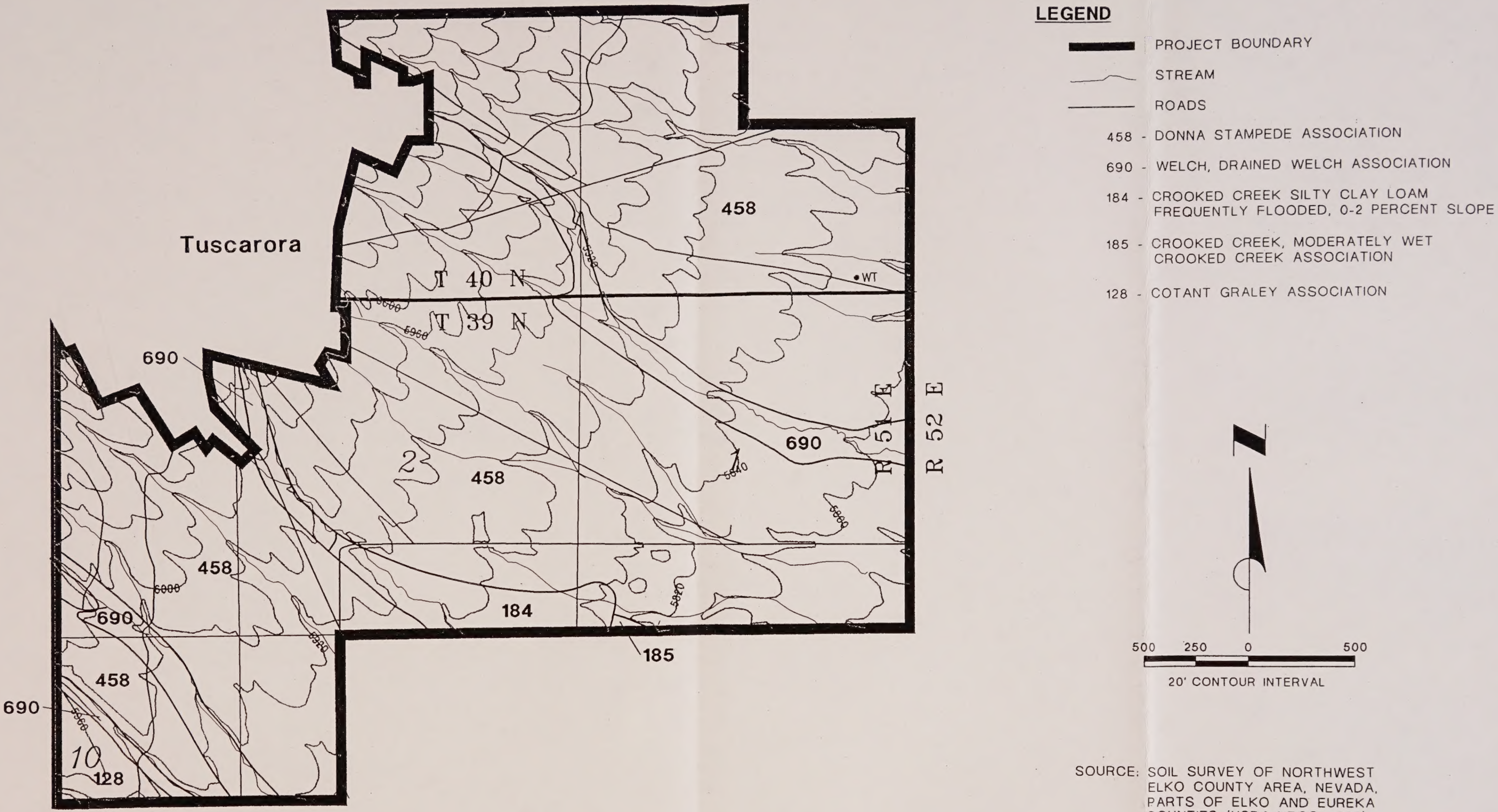
LEGEND
PROJECT BOUNDARY
STREAM
ROADS
458 - DONNA STAMPEDE ASSOCIATION
690 - WELCH, DRAINED WELCH ASSOCIATION
184 - CROOKED CREEK SILTY CLAY LOAM FREQUENTLY FLOODED, 0-2 PERCENT SLOPE
185 - CROOKED CREEK, MODERATELY WET CROOKED CREEK ASSOCIATION
128 - COTANT GRALEY ASSOCIATION
Tuscarora
T 40 N
T 39 N
R 51 E
R 52 E
458
690
184
185
128
2
10
WT
6000
5960
5840
5860
5820
500
250
0
500
20' CONTOUR INTERVAL

SOURCE: SOIL SURVEY OF NORTHWEST ELKO COUNTY AREA, NEVADA, PARTS OF ELKO AND EUREKA COUNTIES (USDA-NRCS, 1997).

FIGURE 3-3

SOIL RESOURCES

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3.1.3 Vegetation

The vegetation community within the project area is sagebrush - grassland. Major vegetative species present are mountain big sagebrush, Wyoming big sagebrush, low sagebrush, black sagebrush, Douglas rabbitbrush, rabbitbrush, bluebunch wheatgrass, Thurber needlegrass, serviceberry, spiny hopsage, Sandberg's bluegrass, bottlebrush squirreltail, Indian ricegrass, lupine, arrowleaf balsamroot, phlox, and aster. The treatment area, shown on Figure 3-1, was planted with crested wheatgrass; the seeding was completed in 1976.

3.1.4 Riparian Areas

There are approximately 19 miles of drainages within the project area; less than 11 percent of the drainage area is represented by perennial riparian areas. Review of the BLM infrared photographs taken July 2, 1979, indicates the total riparian acreage within the property boundary would be approximately 5.2 acres. The riparian areas which exist are disconnected and occur as isolated areas of vegetation along drainages with intermittent flow (Evans, 1998). The majority of these riparian areas are located along the southern boundary of the project area. Riparian plant communities which may be present in these wet meadow range areas consist of Nevada bluegrass, alpine timothy, Sierra clover, meadow sedges, and other perennial grasses (Nyrehn, 1998). The dominant riparian species would be tufted hairgrass in areas where livestock were favorably managed. Potential vegetative composition is approximately 80 percent grasses and 20 percent forbs.

3.1.5 Wildlife

Wildlife species which may occur in the project area include those species that characteristically occur in the northern Great Basin, such as mule deer, coyotes, badgers, bobcats, mountain lions, several rabbit species, various shrews, and a variety of rodents. Upland game birds that may occupy portions of the project area include sage grouse, Hungarian partridge, chukars, and morning doves. An antelope herd is located in the vicinity of the proposed project area.

Raptor species that are likely to utilize portions of the Tuscarora Exploration Project area, either for foraging or nesting, include red-tailed hawk, golden eagle, American kestrel, prairie falcon, and great horned owl. No raptor nest sites are known to occur in the Tuscarora Exploration Project area.

Bird species likely to occur within the vicinity of the Tuscarora Exploration Project include the horned lark, meadowlark, sage thrasher, green-tailed towhee, sage sparrow, and other grassland and grassland-shrub bird species. Reptiles and amphibians including western fence lizard, desert horned lizard, sagebrush lizard,

striped whipsnake, gopher snake, Great Basin spadefoot toad, and western toad would be expected to inhabit the Tuscarora Exploration Project area.

3.1.6 Threatened, Endangered and Special Status Species

The U.S. Fish and Wildlife Service (USFWS) was consulted during January 1997 to determine the potential for or known regional occurrence of threatened, endangered, or species of concern within the vicinity of the Tuscarora Exploration Project. No threatened or endangered species were identified by the USFWS to occur within the Tuscarora Exploration Project area. The USFWS did identify the spotted frog, a candidate species, and 14 species of concern that may occur in the vicinity of the project area. The species of concern are defined by the BLM as former candidate species that are no longer considered by the USFWS to be candidate. Species identified by both the USFWS and BLM as potentially occurring in the project area are listed in Table 3-3.

TABLE 3-3
SPECIES OF CONCERN THAT MAY OCCUR WITHIN THE TUSCARORA EXPLORATION PROJECT AREA

Common Name	Scientific Name
Plants	
Meadow pussytoes	*Antennaria arcuata*
Mammals	
Spotted bat	*Euderma maculatum*
Small-footed myotis	*Myotis ciliolabrum*
Long-eared myotis	*Myotis evotis*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
Pale Townsend's big-eared bat	*Corynorhinus townsendii*
Pacific Townsend's big-eared bat	*Plecotus townsendii townsendii*
Birds	
Western Sage Grouse	*Centrocercus urophasianus*
Northern goshawk	*Accipiter gentilis*
Ferruginous hawk	*Buteo regalis*
Swainson's Hawk	*Buteo swainsoni*
Western Burrowing Owl	*Athene cunicularia hypugea*
Amphibian	
Spotted frog	*Rana pretiosa*

The following paragraphs provide a brief description of each species of concern range and habitat preference and the potential for the species or its habitat to occur within the project area.

Vegetation

Meadow pussytoes

The meadow pussytoes occurs in moist or wet meadows, often hay-meadows, or in moist swales in sagebrush plains at elevations of 5,200 to 6,500 feet AMSL (Conquist, et. al., 1994). This species is rare, known only from a few collections in northeastern Nevada, from south of Belcher's Meadow in Elko County (Kartesz, 1988). Portions of the proposed Tuscarora Exploration Project may provide habitat for the Meadow pussytoes.

Wildlife

Spotted bat

The spotted bat's range covers the majority of the western United States and extends from Texas north into Canada (Arizona Game and Fish Department, 1993). This species is one of the rarest North American bats. The spotted bat roosts primarily in cliffs usually composed of sedimentary rock containing vertical cracks and crevices that provide cover. Several literature sources state that roosting sites are selected near water sources for foraging on moths (Arizona Game and Fish Department, 1993; Easteria, 1970; Wai-Ping and Fenton, 1989). The spotted bat may fly four to seven miles from their roosting site to forage. This species has not been documented to occur within the BLM Elko District. It appears that this species is more likely to occur in isolated areas as the species may be sensitive to human disturbance. This species is not likely to occur in the vicinity of the Tuscarora Exploration Project area.

Small-footed myotis

The small-footed myotis is distributed throughout the western United States except for the northern Pacific coastal areas. This species tends to occur around rocky environments and may also be found in a variety of other habitats such as forests, near watercourses, and even in desert-like areas in central Idaho (Zeveloff, 1988). The species forages on insects while flying low among the trees or brush (Arizona Game and Fish Department, 1993). This species may forage in the vicinity of open water (springs or creeks) occurring within the project area. Adits in the area may provide roosting sites. No sightings of this species have been reported within the project area.

Long-eared myotis

The main habitat of the long-eared myotis is conifer forests occurring in the mountains; however, the species can be found in piñon-juniper communities. Roosting areas can be found in buildings, hollow trees, caves, mines, cliff crevices, and sink holes. Moths are the preferred food source for the long-eared myotis; foraging occurs at relatively low temperatures (Manning and Jones, 1989). No sightings of this species have been reported within the project area to date.

Fringed myotis

The fringed myotis generally occur throughout most of the Intermountain region. This species inhabits a wide variety of environments, from desert scrub communities to fir tree stands in the mountains. Piñon woodlands and oak communities seem to be one of the most commonly used community types. These bats select roosts that have been found in caves, mine tunnels, and buildings. The bats roost in tightly packed clusters. This species is easily disturbed by human presence. During the breeding season, females become particularly susceptible to human activities. No sightings of the fringed myotis have been recorded in this project area to date.

Long-legged myotis

The long-legged myotis inhabit western North America, occurring at elevations ranging between 4,000 and 9,000 feet. This bat species inhabits primarily piñon-juniper, oak, and coniferous forests, but may also be found along watercourses and in deserts (Zeveloff, 1988). The species roosts in buildings, rock crevices, cliffs, and trees. In many areas, they are known to be associated with water and are often observed flying 10 to 15 feet over ponds, streams, water tanks, and open meadows (Arizona Game and Fish Department, 1993). The species has also been observed foraging in forest openings. Caves and mine tunnels are used for hibernation roosts (Warner and Czaplewski, 1984). No sightings of this species have been recorded in the project area. However, the long-legged myotis may forage in the vicinity of open water (springs or creeks) occurring within the project area.

Pale Townsend's big-eared bat

The pale Townsend's big-eared bat inhabits the western United States, including the entire Intermountain West. The species is common in the highlands of the west, often found in scrub plant communities as well as pine, piñon-juniper, and deciduous forests. Although these bats occur in deserts, they are generally uncommon in dry regions (Zeveloff, 1988). This species roosts traditionally in caves, but has moved into man-made caves, such as buildings and mines, often in response to disturbance in natural caves. The pale Townsend's big-eared bat is quite sensitive to human entry into roosts which appears to be the primary cause

of population decline. Unlike other bat species, they do not use cracks or crevices and usually roost in exposed areas, where they are vulnerable to disturbance. From late November through mid-March, the bats hibernate in cool caves and mines. The species may forage in the project area. No sightings of the pale Townsend's big-eared bat have been recorded in the project area.

Pacific Townsend's big-eared bat

Pacific Townsend's big-eared bat lives in a variety of communities, including coastal conifer and broad-leaf forests, oak and conifer woodlands, arid grasslands and deserts, and high-elevation forests and meadows. Throughout most of its geographic range, it is most common in mesic sites (Williams, 1986). The Pacific Townsend's big-eared bat is generally a cave dwelling species. The species is not a crevice rooster and would only roost in the open by hanging from walls and ceilings (USFWS, 1994). Known roosting sites include limestone caves, lava tubes, mine tunnels, buildings, and other human-made structures (Williams, 1986). All known maternity roosts for the Pacific Townsend's big-eared bat are within 330 feet of a stream or riparian zone, and all could be classified as a cave or a cave-type environment (USFWS, 1994). No sightings of the Pacific Townsend's big-eared bat have been recorded in the project area.

Western Sage Grouse

The proposed project area is part of the Independence Valley sage grouse population. The sage grouse population is exhibiting a long-term downward trend; however, at the present the population is stable. Numerous leks occur in the vicinity of the proposed project area; however, no leks occur within the project area boundary. The nearest identified lek is located adjacent to the eastern border of the project area (Lamp, 1997). The northern quadrant of the proposed project area is also located within sage grouse winter habitat.

Northern goshawk

In most areas, the northern goshawk occupies mountain forests in spring and summer with some altitudinal migration into foothills and valleys in the winter (Terres, 1980). Nest trees of this species are commonly located on benches or basins surrounded by much steeper slopes (Call, 1978). Aspen groves are the preferred nesting sites in Nevada (Ryser, 1985), with nest trees typically located within 100 feet of water (Herron et al., 1985). There are no recorded sightings of the northern goshawk within the project area.

Ferruginous hawk

The ferruginous hawk is a wide-ranging species in the west, common in the eastern part of Nevada (Ryser, 1985). In Nevada, the ferruginous hawk prefers scattered juniper trees found at the interface of the piñon-juniper and desert shrub communities for nesting habitat (Herron et al., 1985). They nest in areas that

overlook broad expanses of open ground that can provide an adequate supply of rodents and rabbits. This species generally hunts over open desert country, preying on rodents and rabbits, and occasionally hunts birds or reptiles (Herron et al., 1985). The ferruginous hawk has not been recorded within the project area.

Swainson's Hawk

Swainson's Hawk is found on plains, prairies, dry meadows with few trees, and tundra. It perches near the ground and feeds mainly on rodents when available; otherwise it takes grasshoppers and locusts. Stick nests may be located in a tree, bush, on a cliff, or on the bare ground (Udvardy, 1977). No nest sites are known to occur in the project area.

Western Burrowing Owl

Western Burrowing Owls inhabit the western half of the United States. In Nevada, the Western Burrowing Owl typically migrate from northern to southern portions of Nevada during the winter months; however, they have been observed throughout Nevada during all months of the year (Herron et al., 1985). They prefer open treeless flatlands in which to select burrows. Abandoned burrows of ground dwelling animals such as badger, coyote, and ground squirrel are used to roost and nest in (Herron et al., 1985). Large insects, reptiles, amphibians, and small rodents compose their diet. Many times an active burrow can be determined by the presence of insect exoskeletons and owl pellets near the entrance. The proposed Newcrest site may provide habitat for the Western Burrowing Owl.

Spotted frog

The spotted frog is a highly aquatic species found near permanent water in such habitats as marshy edges of ponds and lakes, in algae-grown overflow ponds of streams and springs with emergent vegetation. Spotted frogs occur in mountainous areas near cold streams and lakes and move overland in spring and summer (Behler and King, 1979). In 1960, the spotted frog was observed in Township 39 North, Range 51 East, Section 3 (Goodwin, 1997). The spotted frog may occur near the two springs within the Tuscarora Exploration Project area.

3.1.7 Visual Resources

The Tuscarora Exploration Project is located within a Visual Resource Management (VRM) Class IV area. Class IV VRM objectives provide for management activities which require major modification of the existing landscape. Every attempt should be made to minimize any impacts through careful location, minimal disturbance, and repeating the basic elements of form, line, color, and texture. The most dominant man-made

features on the landscape are existing exploration roads and disturbances associated with previous mining activities and the town of Tuscarora.

Land forms are rolling and rounded with moderate to steep slopes. Landscape colors include reddish brown and dark gray (soil and rock outcrops) and gray-green (vegetation). Previous mineral exploration activities, similar to those proposed, have created horizontal to very shallow diagonal lines and have exposed the dark gray and reddish brown soils.

3.1.8 Cultural Resources

Between June 12 and July 3, 1997, Western Cultural Resource Management, Inc. (WCRM) conducted a Class III cultural resource inventory of 2,500 acres within Elko County, Nevada for Newcrest (BLM Report No. 1-1612 (P)). Two hundred twenty-five cultural resources were discovered, including 78 isolated artifacts, 43 isolated features, 5 previously recorded sites, and 99 previously unrecorded sites and localities (WCRM, 1998).

All prehistoric sites were recorded as individual sites and given individual agency numbers. All historic loci were recorded as elements of a single historic site (CrNV-12-9311) recommended to be a one-site National Historic District as suggested by the BLM and the State Historic Preservation Office. The localities were evaluated as contributing or non-contributing elements relative to site. Multicomponent localities containing both prehistoric and historic materials were also recorded as elements of site CrNV-12-9311. The prehistoric components of these multicomponent localities were evaluated individually, and not as contributing or non-contributing elements to CrNV-12-9311 (WCRM, 1998).

Thirty-six isolated artifacts are prehistoric and 42 are historic. All isolated features are historic. The isolated features consist of 32 prospects pit(s), 1 claim post, 4 ditches, 2 cairns, and 1 well head/riser (WCRM, 1998).

Sites and localities include 22 prehistoric, 52 historic, and 20 that are multicomponent prehistoric and historic. None of the 22 prehistoric sites are recommended eligible to the National Register of Historic Places. Site CrNV-12-9311 is recommended eligible to the National Register of Historic Places. Site CrNV-12-9311 has 82 historic loci, of which 63 are recommended as non-contributing elements of the site. The remaining 19 are recommended as contributing elements. Of the 19, eight are multicomponent localities (historic and prehistoric) and 11 are historic localities. Three of the multicomponent localities recommended as contributing elements have prehistoric components that are recommended eligible to the National Register of Historic Places (WCRM, 1998).

TABLE 3-4
LOCALITIES OF SITE CrNV-12-9311 RECOMMENDED ELIGIBLE FOR THE NATIONAL REGISTER OF HISTORIC PLACES (NRHP)

Locality Number	Component Eligible	Type of Site
1	Historic	Historic road
3	Historic	Historic debris scatter with a prospect pit and a prehistoric lithic scatter
5	Historic	Historic telegraph line
13	Historic	Historic telegraph line
15	Historic	Historic debris scatter and a prehistoric lithic scatter
24	Prehistoric	Prehistoric lithic scatter with a historic debris scatter and a prospect pit
25	Historic	Historic debris scatter with prospect pits, ditches, and a prehistoric lithic scatter
29	Historic	Historic road
30	Historic	Historic road
35	Historic	Historic Telegraph Line
37	Historic	Historic debris scatter with prospect pits and a prehistoric lithic scatter
41	Prehistoric	Historic debris scatter and a prehistoric lithic scatter
49	Historic	Historic ditch
53	Historic	Historic road
64	Historic	Historic debris scatter with a holding pond, prospect pits, an industrial structure and a prehistoric lithic scatter
67	Prehistoric	Historic debris scatter with prospect pits and a prehistoric lithic scatter
68	Historic	Historic debris scatter
72	Historic	Historic debris scatter with mining and habitation features

Source: WCRM, 1998.

3.1.9 Noxious Weeds

The BLM has listed a number of plant species as Nevada noxious weeds (BLM, 1998). Hoary cress is reported to appear in abundance in the proposed Tuscarora project area following recent prior mining activity and any other ground-disturbing activities (Appendix B).

3.2. NO ACTION ALTERNATIVE

The description of the affected environment for the No Action Alternative would be the same as that for the proposed action.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 PROPOSED ACTION

4.1.1 Water Resources

Two springs and ephemeral surface water resources exist within the project area. Proposed exploration activities would avoid these springs and drainages. Therefore, the proposed Tuscarora Exploration Project would not result in direct impacts to surface water resources. The Tuscarora Exploration Project does have the potential to create erosion and increase sediment from the development of temporary cross country travel routes, exploration roads, and drill sites. Proposed environmental protection measures, identified in Section 2.2, would keep indirect impacts to surface waters to a minimum by using Best Management Practices. Should indirect impacts to water resources occur, they would be only temporary lasting until drill holes are plugged and temporary cross country travel routes, exploration roads, and drill sites are reclaimed with vegetation.

Proposed exploration activities could result in potential direct impacts to groundwater resources since the proposed drilling activities may intercept groundwater. If groundwater is encountered, indirect impacts created could include erosion as the water is discharged. Should impacts to groundwater occur, they would occur periodically as drill sites are developed throughout the 2,399-acre project area as operations are conducted during the summer of 1998. Environmental protection measures have been incorporated into the proposed action such as the construction of sumps and plugging holes according to NAC 534.425 through 534.428 which would reduce direct and indirect impacts to groundwater resources.

4.1.2 Soils

Direct impacts to soils would result from the construction, development, and use of access roads, temporary cross country travel routes, drill sites, and sumps. These impacts could include modification of soil physical characteristics, loss of soil to wind and water erosion, and decreased soil biological activity. Changes would result from mixing soil horizons which reduces the organic matter content of surface soil and lowers soil productivity. Total disturbance to soil resources from the proposed project would be approximately 12 acres.

Although the Crooked Creek silty clay loam is on the hydric soils list, no activities are proposed in that portion of the project area and the area involving the Crooked Creek soil will be avoided.

When access roads are developed, salvaged soils would be bermed on the side. Newcrest assumes that an average of six inches of soil could be temporarily removed across the proposed 12 acres of disturbance, which represents approximately 9,678 cubic yards of soils salvaged. The maximum amount of displaced soil would not occur at one time, nor at one location, but would occur as drill sites and roads would be developed. Therefore, impacts to soils would be dispersed over the 2,399-acre project area and would occur periodically during the one-year period. Impacts to soils would be temporary until drill sites and roads are successfully reclaimed with vegetation.

4.1.3 Vegetation

The direct impact from the proposed project would be the disturbance of 12 acres of sagebrush-grassland communities. Newcrest plans to revegetate exploration disturbance as described in Section 2.2.13. Revegetation success may be hindered by the generally low permeability, low available water capacity, and high water erosion potential of the site soils (Appendix A). Exploration activities would keep direct impacts to vegetation to a minimum which will also serve to protect range improvements. After project exploration activities cease, vegetation would gradually become re-established in disturbed areas by both reseeding and/or recolonization.

Disturbance created would mostly be short-term and linear (roads) or patchy (drill sites) in form. This type of development would be conducive to recolonization from the surrounding areas.

4.1.4 Riparian Areas

Newcrest will avoid riparian areas by at least 100 yards; therefore, no impacts are projected.

4.1.5 Wildlife

Impacts to wildlife (such as common mammals, reptiles and birds) would consist of temporary habitat loss, wildlife displacement as a direct result of the removal and/or crushing of vegetation cover, and disturbance from human activity and noise. Nesting habitat for shrub and ground nesting birds may be removed for the short term until reclamation and reestablishment of shrub species would occur. Activities associated with the proposed exploration may be sufficient to cause mammals, birds, and reptiles to avoid use of suitable habitat in the project area. Wildlife may tend to avoid active drilling sites and may move temporarily to adjacent habitat which would increase population in those areas. The Tuscarora Exploration Project would result in the temporary loss of 12 acres of sagebrush-grassland habitat. Impacts to wildlife habitat would not be large enough to eliminate individual wildlife territories or populations.

Raptors, such as the red-tailed hawk may forage over the project area; however, activities resulting from the Tuscarora Exploration Project are not anticipated to impact any raptor species.

Some habitat loss could occur to passerine bird species such as the horned lark, meadowlark, and sage thrasher; however, this loss is not likely to occur in sufficient quantities to eliminate individual territories.

Soil disturbances and compaction may destroy animal burrows, injure or kill less mobile animals, or trap animals in deep burrows. These incidents would not be expected to have a impact on the wildlife community because ground-dwelling animals are relatively common and vacant territories would likely be recolonized.

Some rabbits and small rodents may be affected by the proposed Tuscarora Exploration Project. A limited amount of mortality may take place as equipment is moved; however, this mortality would not have a long-term population impact.

4.1.6 Threatened, Endangered and Special Status Species

Vegetation

Based on habitat requirements, the Tuscarora Exploration Project area has the potential to provide habitat for the meadow pussytoes. The meadow pussytoes occurs in moist or wet meadows. Newcrest does not propose to conduct surface disturbing activities within 100 yards of the springs or riparian areas. Impacts to the meadow pussytoes are unlikely.

Wildlife

The Tuscarora Exploration Project area has the potential to provide foraging habitat for the following species:

- Spotted bat
- Small-footed myotis
- Long-legged myotis
- Pale Townsend's big-eared bat
- Western Sage Grouse
- Northern goshawk
- Ferruginous hawk

- Swainson's hawk
- Western Burrowing Owl

The bat/myotis species listed above would only be affected if foraging areas were impacted by the proposed exploration project. These species typically forage over or near open water. Newcrest's proposed exploration activities would avoid the two springs located in the project area. Therefore, impacts to these species are not anticipated.

The proposed project area is important to the Independence Valley sage grouse population. There are numerous leks in the vicinity of the proposed project area, with the nearest identified lek bordering the eastern project boundary. Exploration activities would be suspended within a half-mile buffer zone along the eastern border of the project area from March 15 until April 30 to avoid sage grouse strutting and nesting activities. Activities in the wintering habitat would be minimized during December and January. Since drilling would occur during the summer months, impacts to sage grouse strutting, nesting, and wintering activities are not projected.

The Tuscarora Exploration Project would result in the removal of foraging habitat for the northern goshawk and ferruginous hawk. Proposed disturbances represent less than one percent of the total 2,399-acre project area. Therefore, impacts to the northern goshawk and ferruginous hawk are not anticipated as a result of the Tuscarora Exploration Project.

The exploration project area, particularly in the vicinity of the two springs, has the potential to provide habitat for the spotted frog. Since Newcrest does not propose to conduct exploration drilling activities near the two springs, impacts to the spotted frog are unlikely.

4.1.7 Visual Resources

Short-term impacts to line and color would result from the proposed action. The horizontal and shallow diagonal bands and lines from the exploration roads, temporary cross country travel routes, and drill pads would create moderate form and line contrasts with the characteristic landscape. Moderate color contrasts would result from the vegetation removal associated with road and drill pad construction.

Successful reclamation of the exploration roads, temporary cross country travel routes, and drill pads would reduce the long-term visual impacts of the proposed action. Class IV VRM objectives would be met.

4.1.8 Cultural Resources

The Class III cultural resources survey conducted by WCRM identified 225 cultural resources on public lands within the project area. Newcrest plans to avoid these sites by imposing a 150-foot buffer zone around the 19 contributing elements to site CrNV-12-9311. Archeologists would flag drill holes prior to drilling on the site. As such, direct and indirect impacts to cultural resources are not projected.

Avoidance is the preferred management option for all 19 contributing elements to site CrNV-12-9311. If avoidance is not possible, then other measures to mitigate impact would be developed and implemented prior to disturbance. Data recovery might include subsurface excavation, additional surface recording, collection, mapping, and/or photodocumentation.

4.1.9 Noxious Weeds

Hoary cress appears in abundance within the proposed project area and the nearby vicinity. Newcrest would attempt to limit the windblown and mechanical transport of seed sources from exploration activities by avoiding travel through infested areas when possible and inspecting, and if necessary, cleaning vehicles traveling outside the project area for the obvious presence of seed sources. Further, Newcrest would use other noxious weed control treatment methods in consultation with BLM within one year of reclamation activities to limit the spread of hoary cress on areas disturbed by the proposed project.

Minor direct impacts such as creating new stands or expanding existing stands of hoary cress may occur through direct transportation or windblown transport of seed sources. Newcrest would notify BLM of the locations and noxious weed species involved in any discovered infestation areas.

4.2 NO ACTION ALTERNATIVE

Implementation of the No Action Alternative would result in the denial of the proposed Tuscarora Exploration Project. Newcrest would continue to conduct exploration activities on the private lands. This would result in the avoidance of all the identified project-specific resource conflicts on the 2,399 acres of public lands.

4.3 MITIGATION

Mitigation activities would include avoidance and keeping disturbance to a minimum and treatment of noxious weeds, if necessary.

4.4 CUMULATIVE IMPACTS

All resource values have been evaluated for cumulative impacts. It has been determined that cumulative impacts would be negligible as a result of the proposed action or alternatives.

4.5 MONITORING

A BLM representative would make regular field inspections of the Tuscarora Exploration Project area. These inspections would be performed throughout construction, operation, and reclamation of the proposed action. All field compliance inspections would be documented in the project file at the BLM office in Elko, Nevada.

5.0 CONSULTATION AND COORDINATION

5.1 LIST OF PREPARERS

U.S. Bureau of Land Management - Elko Field Office

Roger D. Congdon	Project Lead, Plan Review, Geology
Carol Evans	Fisheries, Riparian Zones/Wetlands
Eric Dillingham	Cultural Resources, Native American Religious Concerns
Stan Kemmerer	Noxious Weeds
Bob Marchio	Lands
Carol Marchio	Soils, Water, Air
Deborah McFarlane	Hazardous Materials
Bob Miller	NEPA Coordination
Donna Nyrehn	Livestock Grazing, Vegetation
Roy Price	Wildlife, Vegetation, T & E Plants and Animals
Evelyn Treiman	Visual Resources, Recreation, Wilderness

WESTEC, Inc.

Gary Goodrich	Project Manager
Val Sawyer	Project Manager
Jane Delling	Project Scientist
Diane J. Taylor	Staff Scientist
Karen Kinsella	Staff Scientist

5.2 PERSONS, GROUPS, OR AGENCIES CONSULTED

Elko County

George Boucher	Elko County Manager

Newcrest Resources, Inc.

Robert T. McCusker	Senior Geologist
Quinton Hennigh	Geologist

Nevada Division of Wildlife

Larry Barngrover	Manager District II
Gary Johnson	Fisheries Biologist
Rory E. Lamp	Biologist

Nevada Natural Heritage Program

Kim Goodwin	Data Manager

Natural Resource Conservation Service - Work Unit Office, Elko, Nevada

Paul Blackburn	Soil Scientist

Te-Moke Tribe of the Western Shoshone

Vince Garcia	Chairman of the South Fork Band
Raymond Gonzales	Chairman of the Elko Band
Gelford Jim	Chairman of the Battle Mountain Band
Andrea Woods	Chairman of the Wells Band

U.S. Fish and Wildlife Service

Carlos Mendoza	State Supervisor
Allan R. Pfister	Assistant Field Supervisor

Western Cultural Resources Management

Thomas J. Lennon	President, Principal Investigator
Edward Stoner	Project Manager

Western Shoshone Historic Preservation Society

Larry Kibby	Director/Consultant

5.3 PUBLIC NOTICE AND AVAILABILITY

As part of the preparation of the Newcrest Tuscarora Exploration Project Environmental Assessment, the BLM solicited comments by letter on the project from numerous agencies, organizations, and the public from February 5, 1997 through March 7, 1997.

The BLM Elko Field Office issued a news release to several news organizations in Nevada, Idaho, and Utah. Copies of the Tuscarora Exploration Project Environmental Assessment can be obtained at the BLM Elko Field Office.

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APPENDIX A
SOILS, ORDER III SURVEY DATA

APPENDIX A
SOILS IN THE VICINITY OF THE TUSCARORA EXPLORATION PROJECT AREA

USDA-NRCS Map Unit	Major Soil Series & Surface Texture	Classification	Elevation (feet)	Landscape Position/ % Slope	Permeability (inches/hr)	Available Water Capacity (inches)	Erosion Hazard Water[1] (K)	Wind Erodibility Group[2]	Topsoil Rating[3]	Approximate Solum Depth Range[4] (inches)	Dominate Present Vegetation
128 Cotant-Graley Association	Cotant very gravelly loam	Aridic argixeroll, clayey, montmorillonitic, frigid, shallow	6,200 to 6,600	Summit of hills 8 to 15	0.06-0.20	0.14-0.16	0.24	8	Poor; depth to rock, too clayey, small stones	3-20	Bluegrass, bottlebrush squireltail, low sagebrush
	Graley very gravelly loam	Lithic argixeroll, clayey-skeletal, montmorillonitic, frigid	6,200 to 6,600	Backslope of hill (north) 8 to 15	0.06-0.20	0.08-0.12	0.17	7	Poor; depth to rock, small stones	12-17	Bluegrass, bottlebrush squireltail, low sagebrush
184 Crooked Creek silty clay loam, frequently flooded	Crooked Creek silty clay loam, frequently flooded	Cumulic haplaquoll, fine, montmorillonitic, frigid	5,700 to 6,200	Intermontane basins 0 to 2	0.06-0.20	1.15-0.17	0.24	7	Poor; too clayey	3-37	Cinquefoil, rush, sedge, tufted hairgrass
185 Crooked Creek, moderately wet-Crooked Creek Association	Crooked Creek silty clay loam, moderately wet, frequently flooded	Cumulic haplaquoll, fine, montmorillonitic, frigid	5,600 to 5,800	Intermontane basins, stream terraces 0 to 2	0.06-0.20	0.15-0.17	0.24	7	Poor; too clayey	4-37	Nevada bluegrass, basin wildrye, mat muhly, willow
	Crooked Creek silty clay loam	Cumulic haplaquoll, fine, montmorillonitic, frigid	5,600 to 5,800	Intermontane basins, flood plains 0 to 2	0.06-0.20	0.15-0.17	0.24	7	Poor; too clayey	4-37	Bluegrass, rush, sedge, tufted hairgrass
458 Donna-Stampede Association	Donna gravelly loam	Abruptic aridic durixeroll, very-fine, montmorillonitic, frigid	5,700 to 6,400	Fan remnants summit (concave) 2 to 8	0.00-0.06	0.14-0.16	0.37	6	Poor; too clayey, small stones, area reclaim	10-30	Bluegrass, bottlebrush squirreltail, low sagebrush
	Stampede gravelly loam	Aridic durixeroll, fine, montmorillonitic, frigid	5,700 to 6,400	Fan remnants summit (convex) 4 to 15	0.00-0.06	0.14-0.16	0.43	6	Poor; too clayey, small stones	10-37	Wyoming big sagebrush, bluegrass, bottlebrush squirreltail
690 Welch, drained-Welch Association	Welch silty loam, drained, rarely flooded	Cumulic Haplaquoll, fine-loamy, mixed, frigid	5,200 to 7,000	Intermontane basins, flood plains 2 to 4	0.20-0.60	0.16-0.21	0.28	5	Fair; too clayey, small stones	10-60	Basin big sagebrush, basin wildrye, bluegrass
	Welch silty loam, frequently flooded	Cumulic Haplaquoll, fine-loamy, mixed, frigid	5,200 to 7,000	Intermontane basins, flood plains 2 to 4	0.20-0.60	0.16-0.21	0.28	8	Fair; too clayey, small stones	10-60	Rush, sedge, tufted hairgrass, willow

Source: *Soil Survey of Northwest Elko County Area, Nevada, Parts of Elko and Eureka Counties*, USDA Natural Resources Conservation Service, 1997 (USDA-NRCS, 1997)

[1] Water Erosion K Factor - Table 16 *Physical Properties of the Soils*; K=water sheet and rill erosion 0.05-0.69; the higher the number the more subseptiable to water erosion.

[2] Wind Erodibility Group - Table 16 *Physical Properties of the Soils*; 8=not subject to wind erosion; 7=very slightly erodible; 6=very slightly erodible; 5= slight erodible.

[3] Table 12 - *Construction Materials*.

[4] Solum Range consists of the A and B horizons.

APPENDIX B
NEVADA NOXIOUS WEEDS LIST

NEVADA NOXIOUS WEEDS LIST

Common Name	Scientific Name
Austrian fieldcress	*Rorippa austriaca*
Austrian peaweed	*Sphaerophysa salsula*
Black henbane	*Hyoscyamus niger*
Camelthorn	*Alhagi pseudalhagi*
Canada thistle	*Cirsium arvense*
Carolina Horsenettle	*Solanum carolinense*
Common crupina	*Crupina vulgaris*
Common St. Johnswort	*Hypercium perforatum*
Dalmation toadflax	*Linaria genistifolia ssp. dalmatica*
Diffuse knapweed	*Centaurea diffusa*
Dyer's woad	*Isatis tinctoria*
Hoary cress	*Cardaria draba*
Houndstongue	*Cynoglossum officinale*
Iberian starthistle	*Centaurea iberica*
Johnsongrass	*Sorghum halepense*
Leafy spurge	*Euphorbia esula*
Mediterranean sage	*Salvia aethiopis*
Medusahead	*Taeniatherum caput-medusae*
Musk thistle	*Carduus nutans*
Perennial pepperweed	*Lepidium latifolium*
Perennial sowthistle	*Sonchus arvensis*
Poison Hemlock	*Conium maculatum*
Puncturevine	*Tribulus terrestris*
Purple Loosestrife	*Lythrum salicaria*
Purple starthistle	*Centaurea calcitrapa*
Rush skeletonweed	*Chondrilla juncea*
Russian knapweed	*Centaurea repens*
Saltcedar	*Tamarix ramosissima*

NEVADA NOXIOUS WEEDS LIST

Common Name	Scientific Name
Scotch thistle	*Onapordum acanthium*
Silverleaf nightshade	*Solanum elaeagnifolium*
Spotted knapweed	*Centaurea maculosa*
Squarrose knapweed	*Centaurea virgata ssp. squarrosa*
Sulfer cinquefoil	*Potentilla recta*
Yellow starthistle	*Centaurea solstitialis*
Yellow toadflax	*Linaria vulgaris*
Waterhemlock	*Cicuta ssp.*
Western waterhemlock	*Cicuta douglasii*
Wild licorice	*Glycyrrhiza lepidota*

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